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A RARE MEXICAN CYCAD.

By W. B. WILSON, Ottawa University.

THROUGH the courtesy of Dr. C. J. Chamberlain, of the University of Chicago, the writer is enabled to present to the Academy for inspection an ovulate cone of the rare cycad *Dioon edule.*

The *Dioon* tree, which is a near relative of the so-called Sago palm of our greenhouses, is found only in tropical Mexico, and there in limited numbers. Little of a scientific nature has been written concerning it, recent publications in the *Botanical Gazette* containing practically all that is authoritative on its morphology.

In 1843, Lindley, of the Smithsonian Institution, found specimens of this tree in the state of Vera Cruz, and listed them as *Dioon edule.* All the *Dioons* were roughly classified under this species until 1883, when Eichler described *Dioon spinulosum*, a few leaves and a few trunks without leaves constituting his material. *Dioon purpusii* was described by Purpus, in 1908, from a few specimens which he collected in the state of Puebla, near Tomellin.

Dioon edule is a small tree, reaching a height of only six or eight feet, with trunk about four to six inches in diameter, bearing a crown of leaves suggesting strongly in habit our Sago palm, or *Cycas revoluta.* A new crop of leaves is produced every alternate year, except those years when the tree goes into a resting state. About twenty leaves, on an average, are put forth in a season, and since the old leaf bases persist they furnish a valuable index to the age of the tree. Conservative estimates fix the life period of a specimen five feet high, under normal conditions, at 1000 years.

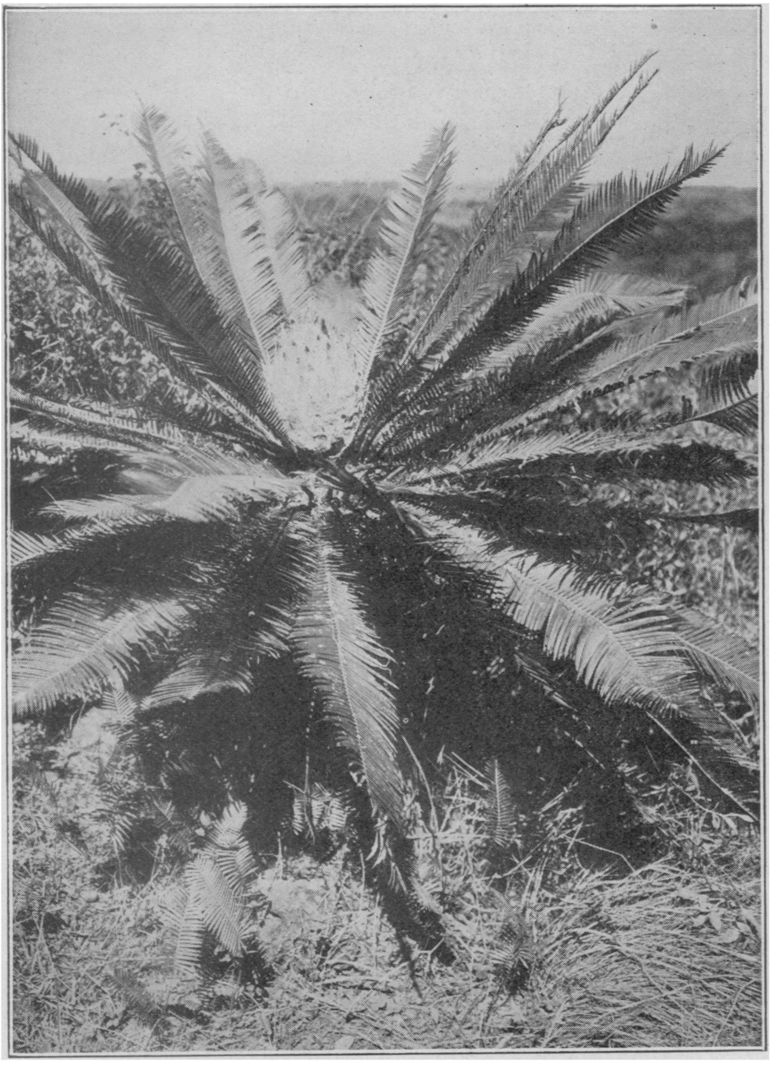
The natural habitat of *Dioon edule* is the open rocky stretches and slopes of the southern Mexican mountains, where it is exposed to the blazing tropical sunlight, though fine specimens are found sometimes growing in sheltered cañons, shaded by bushes and small trees. The Mexican Southern and International railways pass through the *Dioon edule* country. The best specimens have been found on the International line near Chavarrillo, about fifteen miles southeast of Jalapa. *Dioon spinulosum* is fairly abundant near Tierra Blanca, sixty miles south of Vera Cruz. Doctor Chamberlain reports having seen magnificent specimens there, as well as in the vicinity of Tuxtepec, forty miles southeast of Tierra Blanca.

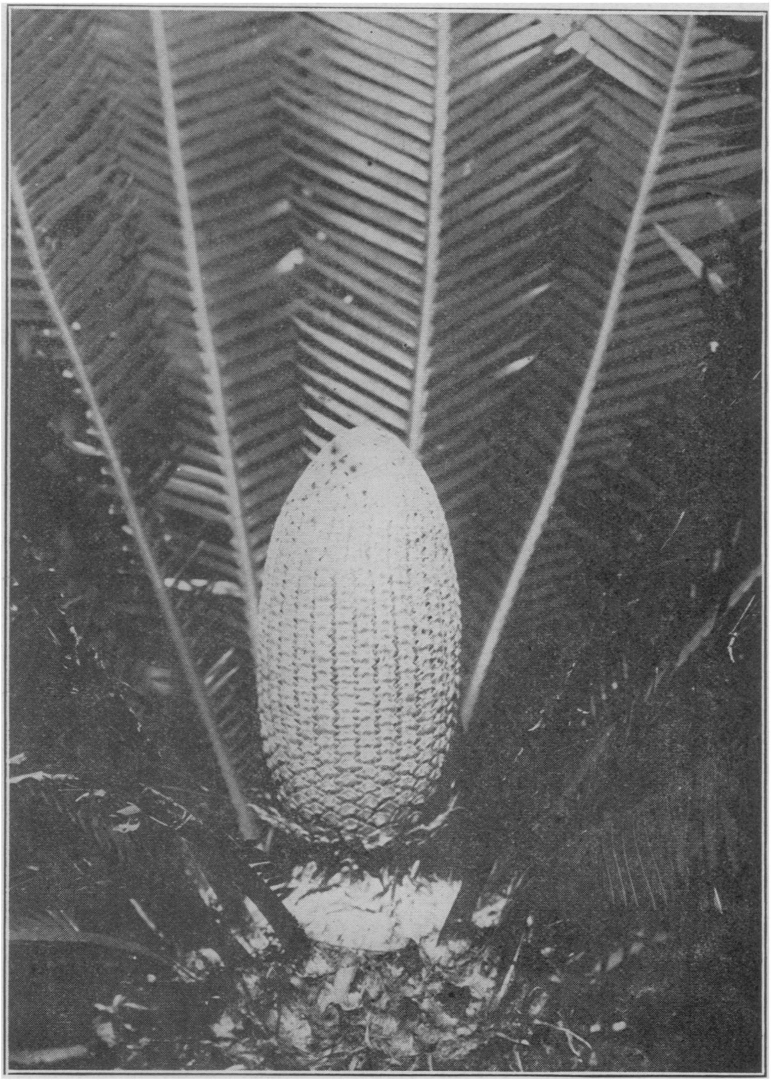
The recently discovered species, *Diocn purpusii*, is found near Tomellin, 300 miles south of the city of Puebla.

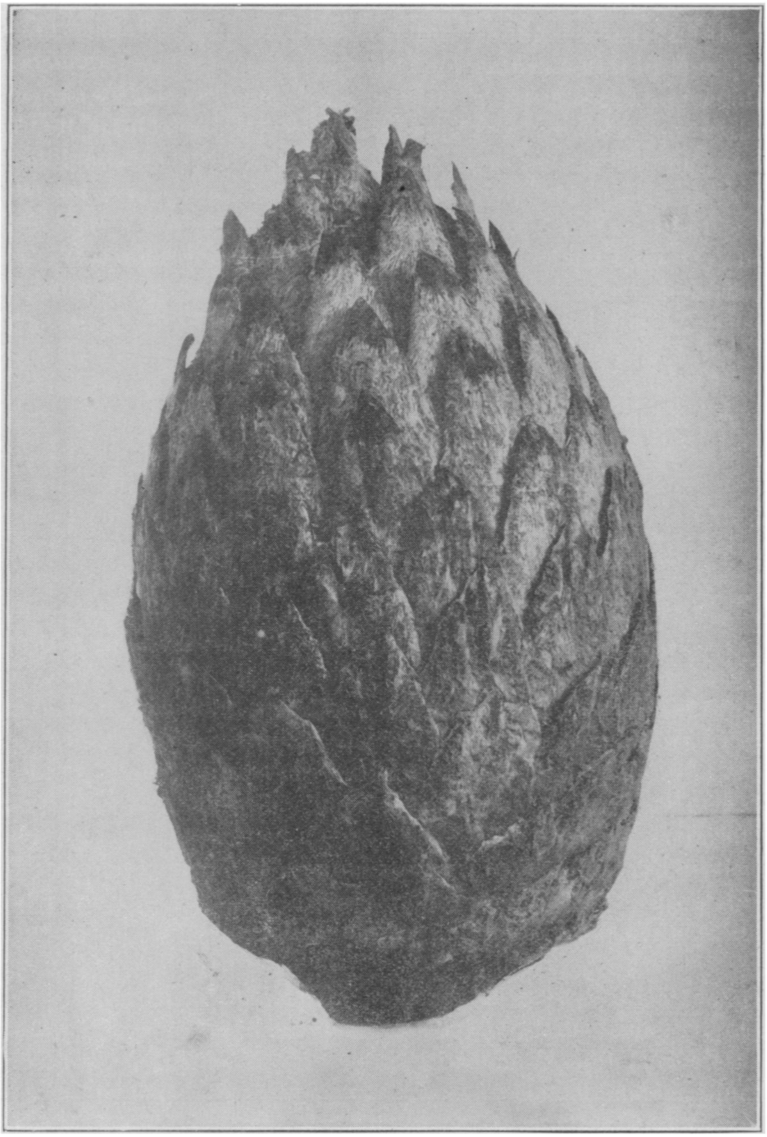
Dioon is diœcious, each individual bearing a single cone at the apex of the stem. The ovulate cone is much larger than the staminate, and constitutes one of the most interesting features of this interesting tree. The average cone is about nine inches in length, six inches in diameter, and weighs about ten pounds. The megasporophylls are large and relatively long and are covered with rementum, a coarse, hairy growth which serves as a splendid protective coat. The cone is somewhat looser in make-up than the ovulate cone of the pine. Two megaspores are borne at the base of each sporophyll, thus giving to the tree the name *Dioon*, which means two eggs. The cone displayed herewith is smaller than the average, being somewhat dwarfed in the upper sporophylls. It was picked in July, near Chavarrillo, sent by parcels post to Chicago, and carried in a grip to Ottawa in August. Since that time it has been kept by the writer in the cellar. It shows no sign of mold or decay. In fact, it is green; so it is safe to say that the gametophytes are still alive and would make interesting histological material.

The staminate cones are much smaller, as has been indicated, and are less conical in shape than the ovulate ones. The collector would scarcely notice them among the leaves in their natural position, as they have very short bases, which do not elevate them above the leaves enough to be seen well from the ground. In July they appear full grown and present a very solid, definite form, with sporophylls regularly arranged in spirals. In the accompanying photograph a few of the topmost leaves have been cut away in order to display the cone. Later the cone lengthens and falls over to one side, while the pollen is shed abundantly. The pollen is produced in microsporangia situated on the upper side of the sporophylls. Several hundreds of these microsporangia are borne on a single microsporophyll, so that the pollen grains are produced in great profusion.

We are indebted to Doctor Chamberlain, of the Hull Botanical Laboratory, Chicago, for definite knowledge of the morphology of *Dioon edule.* With the aid of a grant from the Botanical Society of America he visited Mexico several times to collect material for research. Governor Theodoro A. Dehesa, of Vera Cruz, and Alexander M. Gaw, of the State Bureau of Information, at Jalapa, have coöperated heartily in the work of securing suitable specimens for







study. A detailed account of this morphological research would not fall within the province of this paper.

Dioon edule is confined to an area not one-fourth as large as the state of Kansas, and nowhere do sufficient numbers appear to constitute a forest. *Dioon spinulosum* is very much more abundant, and, being many times larger in habit, presents a far more impressive appearance to the traveler. The uneducated classes in Mexico call *Dioon edule* "Tio Tamal," which is interpreted "Uncle Tamale," for from the seeds they procure a meal from which tamales are made. Many beautiful trees are cut down by the natives to get the cones, because it is the easy way. This thoughtless method threatens the species with extinction, unless steps are taken immediately to protect it. Among the educated Mexicans there is a growing interest in the *Palma de Dolores*, as they call the tree. It is to be hoped that they will preserve this rare cycad and show their appreciation of an exclusive inheritance.